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09/688,010	10/13/2000	Jerome R. Bellegarda	04860.P2564	9170

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EXAMINER
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ART UNIT	PAPER NUMBER
2655	4

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Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *13 October 2000*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-38* is/are pending in the application.

  4a) Of the above claim(s) *39-45* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-38* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☒ Claim(s) *39-45* are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *13 October 2000* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

  Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

  Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

  a)☐ All b)☐ Some * c)☐ None of:

    1.☐ Certified copies of the priority documents have been received.

    2.☐ Certified copies of the priority documents have been received in Application No. _____.

    3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
      application from the International Bureau (PCT Rule 17.2(a)).

  * See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application)
since a specific reference was included in the first sentence of the specification or in an Application Data Sheet.
37 CFR 1.78.

  a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific
reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .

4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .

5) ☐ Notice of Informal Patent Application (PTO-152)

6) ☐ Other: .

Detailed Action

Election/Restrictions

1.   Restriction to one of the following inventions is required under 35 U.S.C. 121:

I.   **Claims 1-38**, drawn to grouping speech with similar semantic meaning through word

agglomeration for voice command recognition, classified in class 704, subclass 257.

II.   **Claims 39-45**, drawn to word grouping for language characterization, classified in class

704, subclass 206.

2.   **Inventions 1, Claims 1-38** and 2, **Claims 39-45** are related as combination and

subcombination, useable separately. Inventions in this relationship are distinct if it can be shown

that (1) the combination as claimed does not require the particulars of the subcombination as

claimed for patentability, and (2) that the subcombination has utility by itself or in other

combinations (MPEP § 806.05(c)). In the instant case, the combination as claimed does not

require the particulars of the subcombination as claimed because other grouping methods exist,

and invention 1 is used for command recognition, while invention 2 can be used for a more

general natural language speech recognition application. The subcombination has separate utility

such as use in a dictation recognition machine where language models would be required.

3.   During a telephone conversation with Sheryl Holloway on 1/9/2004 a provisional

election was made without traverse to prosecute invention 1, **Claims 1-38**. Affirmation of this

election must be made by applicant in replying to this Office action.

4.   **Claims 39-45** are withdrawn from further consideration by the examiner, 37

CFR 1.142(b), as being drawn to a non-elected invention.

Double Patenting

5.   The nonstatutory double patenting rejection is based on a judicially created doctrine

grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or

improper timewise extension of the "right to exclude" granted by a patent and to prevent possible

harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed.

Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686

F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA

1970);and, *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to

overcome an actual or provisional rejection based on a nonstatutory double patenting ground

provided the conflicting application or patent is shown to be commonly owned with this

application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal

disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37

CFR 3.73(b).

6.   **Claims 1-38** are rejected under the judicially created doctrine of obviousness-type double

patenting as being unpatentable over **Claims 1-24** of U.S. Patent No. 6,208,971 in view of Gorin

et al *(U.S. Patent: 5,860,063)*. The addition of a word agglomeration unit to U.S. Patent No.

6,208,971, would have been obvious to one of ordinary skill in the art at the time of invention

since the well-known clustering technique of word agglomeration *(clustering meaningful phrases*

using an agglomerative clustering procedure, Col. 7, Lines 38-39) is a more specific

embodiment of the well-known clustering method referred to in Bellegarda et al (*word sequence classification implemented using clustering algorithms well known to those skilled in the art, Col. 6, Lines 11-17*). Also, the additional limitations pertaining to semantic anchors from training data, calculation of a distance to determine correlation, and word sequence order would all have been obvious to one of ordinary skill in the art, at the time of invention since, respectively, training allows for the well-known technique of detecting speech from a specific speaker, distance calculation is a well-known means of correlation determination in clustering *(Col. 7, Lines 38-39)*, and semantic relations would be dependent upon word order, since semantics regards meaning within language, and words must be properly arranged in order to convey meaning in the form of a complete thought or command.

Claim Objections

7.   **Claims 4, 14, 15, and 34** are objected to because of the following informalities:

- Claim 4 is listed as being dependent upon Claim 1, however it seems that it is intended to be dependent upon Claim 3. The examiner has interpreted Claim 4 as being dependent upon Claim 3 for application of the prior art.
- "of" on Line 2, Claim 14, Line 6, Claim 15, and Line 2, Claim 34 should be corrected to read --from--

Appropriate correction is required.

Claim Rejections - 35 USC § 102

8.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the

basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9.   **Claims 1-6, 20-24, 31, 32, 35, and 36** are rejected under 35 U.S.C. 102(b) as being

anticipated by Gorin et al *(U.S. Patent: 5,860,063)*.

With respect to **Claims 1, 20, 31, and 35**, Gorin discloses:

A method and machine readable medium containing instructions for recognizing speech

(Col. 2, Lines 54-66), the method comprising:

Recognizing a sequence of words received as a voice command *(meaningful phrase*

processed by speech recognizer to perform a related task, Col. 2, Lines 25-29).

Processing the sequence of words using word agglomeration *(clustering meaningful*

phrases using an agglomerative clustering procedure, Col. 7, Lines 38-39).

Classifying the processed sequence of words (vector representation) as a predetermined

command *(classifying clustered phrases related to a command, Col. 7, Line 66- Col. 8, Line 4*

and word sequence vectors, Figs. 6 and 7).

With respect to **Claims 2 and 21**, Gorin recites:

Performing an action corresponding to the predetermined command *(speech input*

command related to a number of executable actions, Col. 4, Lines 21-45).

With respect to **Claims 3 and 22**, Gorin further discloses:

Processing comprising: replacing the sequence of words with an associated word n-tuple sequence (clustering process grouping similar phrases all associated with a single voice command, *Col. 7, Line 38- Col. 8, Line 4)*.

With respect to **Claims 4 and 23**, Gorin recites:

The method of claim 1 (interpreted by the examiner as Claim 3) and computer readable medium of claim 22, wherein the associated word n-tuple sequence is a sequence of all strings of n consecutive words present in the sequence of words *(clustering process grouping similar phrases all associated with a single voice command, Col. 7, Line 38- Col. 8, Line 4 and Fig. 3)*.

With respect to **Claims 5 and 24**, Gorin adds:

Classifying comprising: semantically inferring the predetermined command from the associated word n-tuple sequence *(clustering of phrases through semantic relations used in recognizing a voice command, Col. 8, Lines 58-64)*.

With respect to **Claim 6**, Gorin further discloses:

Classifying comprises semantically inferring the predetermined command from the sequence of words *(clustering of phrases through semantic relations used in recognizing a voice command, Col. 8, Lines 58-64)*.

With respect to **Claims 32 and 36**, Gorin discloses:

An action generator, coupled to the semantic classifier, to use the vector representation to determine an action to be performed *(classification processor, Fig. 4, Element 30, task objectives, Fig. 4, and word sequence vectors, Figs. 6 and 7)*.

Claim Rejections - 35 USC § 103

10.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
> section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
> such that the subject matter as a whole would have been obvious at the time the invention was made to a person
> having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the
> manner in which the invention was made.

11.   **Claims 7 and 12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Gorin et

al *(U.S. Patent: 5,860,063).*

With respect to **Claims 7 and 25**, Gorin teaches the method of determining a command

by phrase clustering through semantic relations as applied to Claim 6. Also, the examiner has

interpreted "semantic anchor" to mean an accompanying word or phrase that helps identify the

specific meaning of a word or phrase (in the present example, a command word or phrase).

Thus, it would have been obvious to one of ordinary skill in the art, at the time of invention, from

the definition of "semantic anchor" as interpreted by the examiner, that the phrase clustering

utilizing semantic relations as taught by Gorin would include a semantic anchor as a means of

identifying the semantic relations between a command phrase and a sequence of words to

differentiate similar phrases as used in various contexts.

With respect to **Claims 8 and 26**, Gorin additionally discloses:

The correlation is a distance between a vector corresponding to the processed sequence of

words and a vector corresponding to the at least one semantic anchor *(distance measure used in*

agglomerative clustering, Col. 7, Lines 38-65, and word sequence vectors, Figs. 6 and 7). Also,

it would have been obvious to one of ordinary skill in the art, at the time of invention, from the

definition of "semantic anchor" as interpreted by the examiner, that the phrase clustering utilizing semantic relations as taught by Gorin would include a semantic anchor vector used in a distance calculation as a means of identifying the semantic relations between a command phrase and a sequence of words to differentiate similar phrases as used in various contexts.

With respect to **Claims 9 and 27**, Gorin teaches the Gorin teaches the method of determining a command by phrase clustering through semantic relations as applied to Claim 7. Also, it would have been obvious to one of ordinary skill in the art, at the time of invention, to select a command having the shortest distance from a semantic anchor since a minimal distance would be directly related to a greater amount of correlation and thus, a higher likelihood that a particular voice command corresponds to a semantic anchor for successful command recognition.

With respect to **Claims 10 and 28**, Gorin further discloses:

The semantic anchor represents a one of a plurality of predetermined commands *(example of words relating to billing and credit card payment commands, providing semantic information to differentiate similar terms within different contexts, Col. 7, Lines 42-49)*.

With respect to **Claims 11 and 29**, Gorin discloses:

The at least one semantic anchor is derived from a training data *(training of a phrase associated with a command, Col. 7, Lines 10-15, to be used in clustering through semantic relations as applied to Claim 6)*.

With respect to **Claims 12 and 30**, Gorin suggests:

Semantically inferring the predetermined command depends on the order of the words in the processed sequence of words *(clustering of phrases through semantic relations used in*

recognizing a voice command, Col. 8, Lines 58-64). One of ordinary skill in the art, at the time

of invention, would have known that a semantic relation is dependent upon word order, since

semantics regards meaning within a given language, and the words must be arranged in certain

order to convey nuances of meaning.

Claims 13, 33, and 37 recite subject matter similar to Claim 8, and thus are rejected for

similar reasons.

Claims 14, 34, and 38 recite subject matter similar to Claim 9, and thus are rejected for

similar reasons.

With respect to **Claim 15**, Gorin teaches the method of comparing a command vector to a

semantic anchor vector via a distance calculation as applied to Claim 9. Also, it would have

been obvious, to one of ordinary skill in the art at the time of invention, to implement the method

of dimensionality reduction by singular value decomposition as recited in Claim 15 as a

correlation calculation portion of a distance between two vectors since it is well-known in the art,

as in a matched filter application, to reduce the distance computation to a correlation coefficient

(cosine of an angle between the vectors being compared) to decrease the distance calculation

complexity.

With respect to **Claim 16**, Gorin further discloses:

The vector representation is an indication of how frequently each of a plurality of word n-

tuples occurs within the processed sequence of words *(phrase vectors containing information*

relating to the phrase occurrence amount, Col. 7, Lines 10-15).

With respect to **Claim 17**, Gorin recites:

The vector representation is an indication of how frequently each of a plurality of word n-tuples occurs with respect to the corresponding command *(phrase vectors containing information relating to the number of occurrences within various command classes, Col. 7, Lines 10-15)*.

With respect to **Claim 18**, Gorin discloses:

Each of the plurality of semantic anchors represents a plurality of different ways of speaking the corresponding command *(Fig. 6, and Col. 7 Line 66-Col. 8, Line 4)*.

With respect to **Claim 19**, Gorin recites the method of clustering similar commands spoken in different manners as applied to Claim 18. Also, it would have been obvious to one of ordinary skill in the art, at the time of invention, that similar phrase clustering as taught by Gorin would also include the clustering of similar commands with variations in word order since those alternate phrases would still be referring to the same command.

Conclusion

14.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure:

- Ehsani et al (US2002/0032564)- teaches a grammar network that enables voice control. In order to recognize a command, similar phrases are clustered using an agglomerative algorithm upon calculating a semantic distance between phrase vectors.
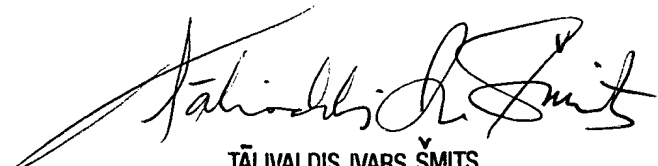
- Gaussier et al (U.S. Patent: 6,308,149)- discloses a method for grouping words in natural language through clustering, which is accomplished using an agglomerative technique.

15.   Any inquiry concerning this communication or earlier communications from the examiner should be directed to James S. Wozniak whose telephone number is (703) 305-8669 and email is James.Wozniak@uspto.gov. The examiner can normally be reached on Mondays-Fridays, 8:30-4:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Talivaldis Ivars Smits can be reached at (703) 306-3011. The fax/phone number for the Technology Center 2600 where this application is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the technology center receptionist whose telephone number is (703) 306-0377.

James S. Wozniak
2/20/2004

TALIVALDIS IVARS SMITS
PRIMARY EXAMINER